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Description of DE4432512	Print	Copy	Contact Us	Close

Result Page

The invention relates to the use of a method to the electrolytic separation of chromium layers from an aqueous CR (VI) - acidic containing electrolytes for the production of gloss or hard chromium layers with practically even surface topography is usual. - The separation can on metallic subject-matters, z. B. Works, in addition, on non-metallic subject-matters, which were equipped with a conductive surface, take place. Structure chromium layers designates coatings made of chrome metal with strongly structured surface topography opposite classical gloss or hard chromium layers with practically even surface topography. The surface topography of structure chromium layers in the sense of the invention usually shows a multiplicity of convex collections with spherical geometry. These collections are each other partly overlapping closely packed and practically free from points or edges arranged outward. Due to the described surface topography structure chromium layers have comparatively high roughness values, for example up to 10 micrometers for the averaged roughness depth, and low Traganteile. From it and from geometry of the collections tribologische properties, those result are substantially improved opposite classical gloss and hard chromium layers. In addition, the surface topography of structure chromium layers leads to a comparatively small Lichtreflektivität. Structure chromium layers become for the technical range as hard chromium layers, D. h. with layer thickness of more than approx. 5 micrometers furnished.

Within this range they essentially protect against abrasivem wear of the work. Decorative structure chromium layers have usually in contrast to this smaller layer thickness.

A method of the kind initially specified is well-known from the literature place DE 42 11 881 A1. With chrome ions containing electrolytes one works, how it is usually used for the separation of a classical hard chromium layer with practically even surface topography. The separation of a structure chromium layer in place of a classical hard chromium layer is reached by the fact that with practically constant amperage, as usual with the separation of classical hard chromium layers, one does not work, but in contrast to this a ?amperage program? with amperage impulses of defined pulse envelope and intermediate impulse tracing is carried out. Since the usual separating plants are not suitable due to the function with practically constant amperage for such a mode of operation, these must be as it were rigged with the appropriate control and regulation-technical mechanisms. These mechanisms must also be designed for it, for high amperage level to change up to 1000 ampere and more highly, the amperage controlled and precisely temporally. This requirement makes mechanisms the lead-through of the method in accordance with the literature place DE 42 11 881 A1 and thus also the method complex and expensive.

In contrast to this the invention the task is the basis to indicate a method to the electrolytic separation of structure chromium layers which works with usual separating plants.

For the solution of this task the invention teaches an use in accordance with claim 1.

A galvanic Chrombad to separating of shining micro-cracked chromium coatings is from DE-PS 20 49 790 well-known. Preferably also a selenium compound is added to the Chrombad. During this chrome separation however with current densities from 150 to 200 A/0,09 one m< 2> worked and a satisfied aliphatic sulphonic acid is not used in the Chrombad.

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As salt in accordance with claim 1 z are designated. B. Sulphates, halides, carbonates, chromates, Dichromate, oxides, hydroxides, acetates, oxalates, sulphonates as well as connections, with which the element in the anion is present, the elements mentioned. Constant amperage means that the amperage does not vary between in and elimination of the stream around any more than 10 per cent. The invention is based on the surprising realization that the additive promotes a germ formation with addition in the indicated quantity concerning the chrome separation at the beginning of the separating procedure, practically independently of the selected amperage. The amperage remains in the course of the separation essentially constant and with the beginning and with the end of the separating procedure strongly is only changed, D. h. switched on and off. Probably a competition between the metal ions of the additive and the chrome ions steps with the consequence of a masking effect at the beginning of the separating procedure at the surface of the subject-matter which can be coated. Thus first local chrome islands develop. In the further process of the separating procedure chrome ions preferably deposit themselves at the chrome islands, whereby the gaps between the chrome islands it is as it were closed up and whereby essentially spherical geometry of the convex collections develops. According to invention a structure chromium layer applied with the method clings nevertheless surprisingly outstanding on the coated subject-matter. Possibly the initial masking effect is reversible or it sufficiently responsible boundary surface phases under participation of the elements is formed.

In the context of the invention different possibilities of the further construction exist. So can be worked with sulfuric acids electrolytes. Of course also a so-called mix-acidic electrolyte with a mixture can be used out for example sulphuric acid and Hexafluorokieselsäure. With electrolytes one works according to invention, of which a satisfied aliphatic sulphonic acid contains. Such an electrolyte is in detail in the literature place DE 34 02 554 C2 described.

In detail the surface roughness of the structure chromium layer can become by adjustment of the separating duration

and/or the separating Rome density and/or the electrolyte composition controlled. A particularly high surface roughness, D. h. , one receives a very much minted surface structure, if the separating duration is particularly long selected. Same can be reached also with a relatively high separating Rome density. An influence of surface roughness by means of the electrolyte composition takes place, as the quantities of the bath components and those of the additives are varied. Low temperatures increase tendentious the surface roughness.

Becomes according to invention with a current density from 40 to 80 A/dm< 2> worked. As electrolyte temperature a temperature worked satisfactorily within the range of 20 to 80 DEG C, preferably from 40 to 60 DEG C.

The invention is more near described in the following on the basis embodiments.

Example 1

A sample test specimen became in electrolytes with 350 g/l CrO_3, 3.85 g/l H_2SO_4, 2.5 g/l methane-sulfone-acidic and 0.004 Mol/l of the additive of width unit as H_6TeO_6 30 min. with a current density of 50 A/dm< 2 > treated. The layer thickness amounted to 25 micrometers. The averaged roughness depth was intended for computer centre = 5.0 micrometers. An illustration of the surface in 240-facher increasing is in the Fig. 1 represented.

Example 2 and comparison example

A sample test specimen became in electrolytes with 350 g/l CrO_3, 3.85 g/l H_2SO_4, 2.5 g/l methane-sulfone-acidic and 0.004 Mol/l of the additive of width unit as H_2TeO_6 36 min. with a current density of 50 A/dm< 2> treated. The layer thickness amounted to thereafter 30 micrometers. Comparatively a sample test specimen in electrolytes with 300 g/l CrO_3, 4 g/l H_2SO_4 and 3.5 g/l methane-sulfone-acidic became, however without additive for 5 min. with a current density of 50 A/dm< 2> treated. The total coating thickness amounted to from this 35 micrometers. The averaged roughness depth and arithmetic center roughness were intended to computer centre = 6.5 micrometers and for RA = 1.0 micrometers. An illustration of in such a way received surface in 240-facher increasing is in Fig. 2 represented.